

Notice of Allowability

Application No.

10/082,926

Applicant(s)

HOBBS, STEVEN MICHAEL

Examiner

Erica E Cadugan

Art Unit

3722

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to amendment of 5/04 and interview of 9/04.
2. ☒ The allowed claim(s) is/are 1-4,6-7,9-21,37,39 and 41-43.
3. ☒ The drawings filed on 22 April 2002 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

ERICA CADUGAN
PRIMARY EXAMINER

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Derek Stettner on September 1, 2004.

2. The application has been amended as follows:

Claim 1 (Currently Amended). A machine tool arranged to machine an object from material that is being processed and having a material-remover,

said material-remover having at least two degrees of freedom of movement and at an instant being arranged to move with a ~~speed~~ velocity and to remove an amount of material up to a depth of cut from the material that is being processed,

processing circuitry being provided and arranged to control the movement of said material-remover including being arranged to control said depth of cut,

the processing circuitry further comprising a track planner arranged to associate one or more tracks around the perimeter of the object to be machined,

the or each said track comprising a locus of paths bounded by the minimum and maximum depths of cut that the material-remover can be controlled along around the object in a single pass,

the processing circuitry being further arranged to determine the path along which the material-remover is caused to move from within the or each track, allowing said depth of cut to

Art Unit: 3722

vary such that a predetermined speed is maintained as the material-remover moves along the determined path,

the processing circuitry further comprising a node associator arranged to associate nodes, each having a radius, with predetermined points of the or each track such that the determined path is tangent to the nodes.

Claim 8 has been canceled.

Claim 9 (Currently Amended). The machine tool of claim [[8]] 1 in which the node associator is arranged to associate the nodes with corners of the or each track.

Claim 10 (Currently Amended). The machine tool of claim [[8]] 1 in which the or each track comprises an inside edge region and an outside edge region, said inside edge being shorter than said outside edge region and in which the node associator is arranged to associate at least some of the nodes with the inside edge region of the or each track.

Claim 12 (Currently Amended). The machine tool of claim [[8]] 1 in which the processing circuitry further comprises a curve associator arranged to associate a curve with each of the nodes produced by the node associator.

Non-elected claims 22-25, 27-31, and 33-36 have been canceled.

Claim 37 (Currently amended). A computer readable medium coded with instructions that when loaded into a machine tool according to claim 1 cause the machine tool to be controlled ~~as claimed in claim 1~~ such that the one or more tracks are associated around the perimeter of the object to be machined, the nodes are associated with the predetermined points of the track, and the path is determined such that the depth of cut thereof varies and such that the path is tangent to the nodes.

Art Unit: 3722

Claim 39 (Currently Amended). A machine tool arranged to machine an object from material that is being processed and having a material-remover,

said material-remover having at least two degrees of freedom of movement, and at an instant being arranged to remove an amount of material, up to a depth of cut, from material that is being processed,

processing circuitry being provided and arranged to control the movement of said material-remover, said processing circuitry determining a path along which said material-remover should move, and in determining said path, said processing circuitry allowing said depth of cut to be made by the material-remover to vary,

the processing circuitry further comprising a track planner arranged to associate one or more contours around the perimeter of an object to be machined, the or each said contour comprising a locus of the paths the material-remover can be controlled along around the object,

the processing circuitry further comprises a node associator arranged to associate a number of nodes, each having a radius, with predetermined points around the or each contour ~~track~~ that has or have been associated,

the processing circuitry further comprising a curve associator arranged to associate a curve with at least a portion of the periphery of each of the nodes produced by the node associator,

the processing circuitry further comprises a tangent generator arranged to associate a path between each of the curves generated by the curve associator,

Art Unit: 3722

wherein the processing circuitry is arranged to convert the tangents generated by the tangent generator together with portions of the curves provided by the curve associator into a path for the material remover.

Non-elected claim 40 has been canceled.

Claim 41 (Currently Amended). The machine tool of claim 1 in which the material-remover is arranged to rotate about an axis and in which the depth of cut is defined in a direction radial to the rotation axis.

Claim 42 (Currently Amended). The machine tool of claim 6 in which the ~~processing circuitry further comprises a node associator~~ is arranged to associate a number of the nodes with predetermined points around the or each contour.

Claim 43 (Currently Amended). The machine tool of claim 42 in which the node associator is arranged to associate the nodes with corners of the or each contour.

3. The following is an examiner's statement of reasons for allowance:

Regarding independent claim 1, U.S. Pat. No. 4,833,617 to Wang is representative of the closest prior art of record to the present invention as set forth in independent claim 1. Wang was discussed in detail in the office action mailed 11/19/2003, and as such, such detail will not be repeated herein. Suffice it to say, it is noted that the consideration of where to place the path along which the tool moves is considered to be inherently based on a consideration of what paths are possible, i.e., a "locus of paths bounded by the minimum and maximum depths of cut that the material-remover can be controlled along around the object in a single pass" as in claim 1. Note that if a path was determined that involved a depth of cut that was greater than that which is possible in a single pass, the machining device could not function.

Art Unit: 3722

Also, it is noted that in the response filed 5/24/2004, Applicant asserted that “[I]n summary, the ‘617 reference teaches to reduce the feedrate, i.e., rotational speed of the cutting tool, when the load increases, for example as the depth of cut increases.” However, Examiner notes that this does not appear to be an accurate representation of the teachings of ‘617, i.e., feedrate is not the same thing as the rotational speed of the tool as asserted by Applicant. Note specifically that ‘617 differentiates between feedrate, i.e., the rate of traversal of the tool as it is translated across the workpiece, and cutting speed, i.e., the speed at which the cutting tool is rotated, and further note that ‘617 explicitly teaches that cutting speed is maintained as a constant while the feedrate is varied. See specifically column 6, lines 43-55, and especially lines 43-47, which state:

Basically, there are two parameters which can be adjusted when the cutting force is too high. One can either increase the cutting speed, or decrease the feed, or both. Since the speed has significant impact on tool life and cost, we chose not to dynamically adjust speed.

It is additionally noted that the feedrate calculation (for determining the varying feedrate) is dependent on the variation in depth of cut (col. 5, line 29 through col. 6, line 43, for example, and especially, col. 5, lines 29-38). Thus, the cutting speed is held constant, and the feedrate is varied and is determined in part from the depth of cut or variation thereof as described above. Thus, the depth of cut is “allowed to vary such that a predetermined speed is maintained as the material remover moves along the determined path” as set forth in claim 1.

However, Wang does not teach that the “processing circuitry” comprises “a node associator arranged to associate nodes, each having a radius, with predetermined points of the or each track such that the determined path is tangent to the nodes” as set forth in claim 1.

Art Unit: 3722

Furthermore, there is no combinable teaching in the prior art of record that would reasonably motivate one having ordinary skill in the art to so modify the teachings of Wang, and thus, for at least this reasoning, Wang does not render obvious the present invention as set forth in independent claim 1. For example, regarding U.S. Pat. No. 4,445,182 to Morita et al., note specifically that the “nodes” or points a-f along the tool path (see Figures 4a-4e for example) are points rather than circles and thus do not have a radius. Note also that the circles along the path shown in Figures 4c and 44, for example, are representative of a cross -section through the tool as it moves along the path (see col. 6, lines 4-10 and col. 22, line 32 through col. 23, line 12 and Figures 4 and 44, for example), rather than any “nodes” that are “assigned to predetermined points”, and it is further noted that as shown in Figure 44, for example, the tool path is not “tangent” to all the circles. Thus, Morita et al. does not serve to overcome the deficiencies of Wang. Similarly, in U.S. Pat. No. 4,949,270 to Shima et al., as shown in Figure 1, the tool path TLP is shown as the line along which the center of the tool TL follows. Thus, even assuming arguendo that the circles TL representing the cross section of the tool could be considered the claimed “nodes, each having a radius”, it is noted that the determined path is not “tangent” to the nodes, but instead intersects the center of each one (see Figure 1, for example). Thus, Shima et al. also does not serve to overcome the deficiencies of Wang. Similarly, as taught by GB 2363208, note that the tool path is not tangent to the “nodes” (see Figure 10B).

Additionally, DE 196 24 131 (hereinafter ‘131, with an English equivalent document U.S. Pat. Application Publication No. 2001/0043842) is considered representative of the closest prior art of record to the present invention as set forth in independent claim 39. ‘131 was discussed in detail in the office action mailed 11/19/2003, and as such, such detail will not be

Art Unit: 3722

repeated herein. Suffice it to say, it is noted that, even though applicant has asserted that the method described by the '131 reference of manufacturing an embossing plate are "subject to different requirements and uses and provides a different service than the 'roughing' process of the embodiments of the invention", there is no claim language set forth to so distinguish the present invention, i.e., no claim language regarding the amount of precision or lack thereof of the machining process, nor any claim language that serve to distinguish the claimed workpiece, e.g., "an object from a material" as set forth in claim 39, from the specific printing plate workpiece described by '131. Thus, in response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., the precision of the operation as being a "roughing" process, nor the particulars of some work piece that does not read on a "printing plate") are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). It is further noted that the depth of cut varies in the '131 patent as described in the preceding office action, and that the consideration of the where to place the tool path must inherently include consideration of the possible tool paths, i.e., if it did not include such consideration, nothing could be produced, as the work piece could not be produced with an *impossible* tool path. The fact that the depth of cut is selected based on how much ink the machined portion needs to retain does not alter the fact that the depth of cut varies, and if the machined area has a depth exceeding the possible depth of cut, then multiple cuts would need to be made (see also claim 12 of the English equivalent, for example), i.e., the possible paths must be taken into consideration when determining the actual tool path.

Art Unit: 3722

Additionally, even though applicant has asserted that '131 is in a different field of endeavor because it relates to "engraving" rather than "milling", it is noted that regardless of the term utilized by the inventors in the '131 patent (i.e., milling or engraving), the operation is the same -- removing desired amounts of material along a desired path with a rotating mechanical cutter (see the English equivalent, claim 17, for example). Further note that claim 39, for example, does not set forth a "milling" operation, but rather merely sets forth the much broader "machining" operation. Again note that although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Further, it is noted that Applicant has also asserted that '131 is in a different field of endeavor because it is not the "roughing" of the present invention, and because '131 is in the field of "embossing". However, firstly, again note that no claim language relating to the precision of the machining operation is set forth in the claims, and again note that although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Additionally, it is noted that regardless of the precision of the machining operation, both the present invention and the '131 are in the field of endeavor of machining a work piece along a complex path determined with a controller. Secondly, it is noted that even though Applicant has asserted that the '131 reference is in the field of "embossing", whether or not the work piece taught by '131 is a printing plate does not change the fact that '131 also teaches the machining of (emphasis added) that printing plate.

Art Unit: 3722

However, it is noted that the “nodes” or points found at the corners within the tool path taught by ‘131 are points and thus do not each “have a radius” as set forth in independent claim 39. It is also noted that the curves taught by ‘131 (such as those shown in Figure 7, one of which being labeled ‘23’) are not “associated with” at “least a portion of the periphery of each of the nodes” as set forth in claim 39, but instead intersect the “nodes” or points.

For at least this reasoning, ‘131 does not anticipate the present invention as set forth in independent claim 39.

Additionally, there is no combinable teaching in the prior art of record that would reasonably motivate one having ordinary skill in the art to so modify the teachings 131, and thus, for at least this reasoning, ‘131 does not render obvious the present invention as set forth in independent claim 39.

For at least the foregoing reasoning, the prior art of record neither anticipates nor renders obvious the present invention as set forth in independent claims 1 and 39.

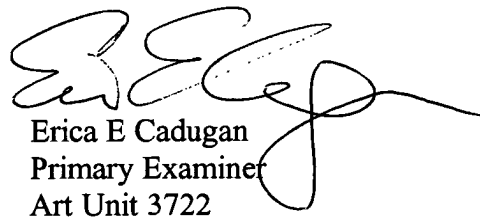
Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled “Comments on Statement of Reasons for Allowance.”

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Erica E Cadugan whose telephone number is (703) 308-6395. The examiner can normally be reached on M-F, 7:30 a.m. to 5:00 p.m., alternate Fridays off.

Art Unit: 3722

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrea L. Wellington can be reached on (703) 308-2159. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Erica E Cadugan
Primary Examiner
Art Unit 3722

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